INTI
International College Penang
LAUREATE INTERNATIONAL UNIVERSITIES®

FINAL 1 RESIT
Examination Paper

(COVER PAGE)

Session	:	January 2014
Programme	:	Foundation in Business Information Technology (CFPI)
Course	:	**STA1202: STATISTICS**
Date of Examination	:	12 March 2014
Time	:	11.00am – 1.00pm Reading Time : Nil
Duration	:	2 Hours
Special Instructions	:	

This paper consists of **SIX (6)** questions. Answer any **FIVE (5)** questions in the answer booklet provided. All questions carry equal marks.

Materials permitted :

Non-programmable scientific calculator

Materials provided :

Graph Paper &Formula Booklet 2

Examiner(s)	:	**Chan Ah Wah**
Moderator	:	**TENG MEI TUAN**

This paper consists of 7 printed pages, including the cover page.

INTI INTERNATIONAL COLLEGE PENANG

FOUNDATION IN BUSINESS INFORMATION TECHNOLOGY (CFPI)

STA1202 : STATISTICS

FINAL EXAM : JANUARY 2014 SESSION

Instructions

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Question 1

Table 1 shows the length (to nearest cm) of wires in a store room :

Table 1:

Length of wire (cm)	150 – 154	155 – 159	160 – 164	165 – 169	170 – 174	175 – 179
Number of wires	5	8	10	7	6	4

(a) Using the data in Table 1, copy and complete the following table :

Class Boundary	f	Cumulative Frequency	x	fx	fx^2
149.5 – 154.5 154.5 – 159.5					
	$\sum f =$			$\sum fx =$	$\sum fx^2 =$

[5 marks]

(b) Based on the results in (a), calculate

(i) the mean, [2 marks]

(ii) the variance (σ_n^2), [3 marks]

(iii) the mode, [3 marks]

(iv) the interquartile range of the wires . [7 marks]

Question 2

(a) Twelve of the twenty crops displayed at an agriculture exposition are from MARDI. If two of the crops displayed are selected randomly,

(i) find the probability that both crops are from MARDI, [2 marks]

(ii) find the probability that exactly one crop is from MARDI . [2 marks]

(b) Table 2 shows the distribution of marks obtained by 40 students in a statistics examination. Given that 12.5% of the students score less than 39 marks .

Table 2: Marks Distribution

Marks	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79	80 – 89	90 – 99
Number of students	2	x	5	8	9	y	4	2

(i) Find the values of x and y . [3 marks]

(ii) Draw an **ogive** on a graph paper to represent the data. The scale to use is : 1cm to represent 10 marks on the horizontal axis, and 1cm to represent 1 student on the vertical axis. [5 marks]

(iii) Suppose that a student who scores between 51 and 74 marks will obtain a credit, calculate the percentage of students who obtained a credit . [2 marks]

(iv) If 75% of the students score more that z marks, determine the value of z . [2 marks]

(v) If 10% of the students failed the examination, determine the passing mark . [2 marks]

(vi) Given that the top four students will represent the college in the district level statistics competition, find the minimum mark achieved by this select group of students . [2 marks]

Question 3

(a) Table 3 shows the profits made by 40 students during a school building Fund Raising Day .

Table 3: Profits Distribution

Profit (RM)	41 – 50	51 – 60	61 – 70	71 – 80	81 – 90	91 – 100
Number of students	5	6	8	10	7	4

(i) Draw on graph paper a **histogram** for the data. The scale to use is : 1cm to represent RM10 on the horizontal axis, and 1cm to represent 1 student on the vertical axis . [4 marks]

(ii) Draw a frequency polygon for the data . [2 marks]

(b) Shown in Table 4 is a random sample of 200 adults classified according to gender and the level of education attained .

Table 4: Education Attainment

	Male (M)	Female(F)	Total
Secondary Education (S)	53	84	137
College Education (C)	27	36	63
Total	80	120	200

If an adult is picked at random from the sample, find the probability that the adult

(i) attains secondary education, [1 mark]

(ii) attains a college education and is a female, [2 marks]

(iii) is a male or attains a college education . [3 marks]

(iv) If a male and a female are picked at random from the sample, find the probability that only one of them attains a college education . [3 marks]

(v) Are the events 'an adult is a male' and 'an adult attains a secondary education' independent? State your reason clearly . [5 marks]

Question 4

(a) The discrete random variable $\mathbf{X}$ has the following probability distribution :

x	7	8	9	10	11
$P(\mathbf{X} = x)$	0.2	a	0.3	0.1	b

(i) If $E(\mathbf{X}) = 9.05$, write down two equations involving a and b . [2 marks]

Then, find the values of

(ii) a and b, [2 marks]

(iii) $E(\mathbf{X}^2)$, [2 marks]

(iv) $\text{Var}(\mathbf{X})$, [2 marks]

(v) $\text{Var}(-2\mathbf{X}+2)$, [2 marks]

(vi) $P(8 < \mathbf{X} \leq 10)$. [2 marks]

(b) When a car owner needs to service her car, she phones one of the three garages : A, B or C. Of her phone calls to them, 30% are to garage A, 10% are to garage B, 60% are to garage C. The occasions (in %) when a garage phoned can take the car on the day are 20% for A, 6% for B, 9% for C .

(i) Draw a tree diagram to represent the above information . [2 marks]

(ii) Find the probability that the garage phoned will not be able to take the car on the day she called . [2 marks]

(iii) Find the probability that she phoned garage C, and C is able to take the car on the day she called . [2 marks]

(iv) Given that the car owner phones a garage, and the garage can take car on that day, find the probability that she phoned garage B . [2 marks]

Question 5

(a) A man submits 5 sets of an application form for the shares of Company ABC. If the probability of each application being successful is $\frac{1}{8}$,

(i) state the binomial distribution applicable to this problem . [3 marks]

And then, find the probability that

(ii) none of his application is successful, [2 marks]

(iii) at least one application was successful, [2 marks]

(iv) not more than 2 applications were successful, giving your answers correct to 4 significant figures . [4 marks]

(b) It is known that 5% of the durians produced in an orchard in Balik Pulau do not bear fleshy fruit.

(i) State the Poisson approximation applicable to this problem . [3 marks]

(ii) Calculate the probability that of the 50 durians selected randomly, less than 3 do not bear fleshy fruit . [6 marks]

Question 6

(a) A certain type of mango grown in Penang has a weight which is normally distributed with mean of 0.5kg, and standard deviation of 0.05kg. Calculate the probability that a randomly chosen mango has weight

(i) less that 0.65kg ,
[3 marks]

(ii) greater that 0.45kg ,
[3 marks]

(iii) between 0.4kg and 0.6kg .
[4 marks]

(iv) In a lorry load of 10,000 of these mangoes, estimate how many will have weights less that 0.4kg .
[5 marks]

(b) The mangoes in part (a) are classified as large (L), medium (M) and small (S). If 20% of the mangoes are classified as large, 35% are small, and the rest medium, calculate the value of L .
[5 marks]

———— End of Paper ————

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SOME RELEVANT FORMULAS :

1. Mode :

$$x_{\text{mode}} = L + \left[\frac{f - f_b}{(f - f_b) + (f - f_c)}\right] c$$

L = Modal class lower bound

c = Modal class width

f_b = Frequency of class before modal class

f_a = Frequency of class after modal class

f = Frequency of modal class

2. Median :

$$x_{\text{median}} = Q_2 = L + \left[\frac{\frac{n}{2} - F}{f_m}\right] c$$

L = Medial class lower bound

n = Sample size

F = Sum of frequencies of classes below medial class

f_m = Frequency of medial class

c = Medial class width

3. Lower Quartile :

$$Q_1 = L + \left[\frac{\frac{n}{4} - F}{f_{Q_1}}\right] c$$

L = Quartile class lower bound

F = Sum of frequencies of classes below quartile class containing Q_1

f_{Q_1} = Frequency of quartile class containing Q_1

4. Upper Quartile :

$$Q_3 = L + \left[\frac{\frac{3n}{4} - F}{f_{Q_3}}\right] c$$

L = Quartile class lower bound

F = Sum of frequencies of classes below quartile class containing Q_3

f_{Q_3} = Frequency of quartile class containing Q_3